

copyright reserved

GARDEN

1. EUPHORBIA, L. SPURGE.

Flowers monœcious, destitute of calyx and corolla; the single pistillate, and several monandrous staminate ones included in a cup-shaped or top-shaped 4-5-toothed involucre, which has commonly thick and often colored glands between the teeth. Styles 3, 2-cleft. Capsule exserted, 3-celled: carpels 2-valved, 1-seeded.—A polymorphous genus of plants with acrid milky juice.

§ 1. Leaves without stipules.

- * Stem erect, umbellately branched above: involucres solitary, terminal and in the forks of the branches: leaves of the stem alternate, those of the branches opposite or whorled.
- Glands of the involucre 5, with white petal-like appendages: leaves entire: perennials.
- 1. E. corollata, L. Stem smooth or pubescent; branches 4-6, twice or thrice forking, mostly short and fastigiate; leaves thick, oblong or oval, obtuse, pale and mostly hairy beneath; involucres pedicelled; appendages of the (green)

glands orbicular, showy; capsule and seed smooth. (E. paniculata, Ell.) — Var. ANGUSTIFOLIA, Ell. Stems slender; branches mostly 3, forking, elongated, spreading; leaves varying from linear to obovate; involucres small, scattered; appendages of the glands transversely oblong. — Dry rich soil, Florida to Mississippi, and northward; the var. in sandy pine barrens. July – Sept. — Stem 1°-2° high.

- 2. **E.** discoidalis, n. sp. Smooth or pubescent; branches commonly 2, divaricate, forking; leaves linear, obtuse, with the margins revolute; involucres on slender pedicels; glands deep red, bordered by the narrow appendages; seeds obovate, pale, minutely pitted.—Dry sandy pine barrens near the coast, West Florida. Aug.—Oct. Plant 6'—18' high; the stem much shorter than the branches. Leaves 2'—3' long, 1"—2" wide. Involucres scattered.
- 3. **E. Curtisii**, Engelm. Smooth; stems filiform; branches mostly 3, erect, sparingly divided; leaves thin, linear or linear-oblong, obtuse, short-petioled, spreading or recurved; involucres minute, scattered, on long capillary pedicels; glands green, margined by the white crenate appendages; capsule erect, short-stalked, round-angled; seed globose, smooth. Low pine barrens, Florida to North Carolina. Aug. Plant 6'-9' high, sometimes branching from the base. Leaves $\frac{1}{2}'-1\frac{1}{2}'$ long.
 - + + Glands of the involucre 5, without appendages.

++ Annuals.

- 4. **E. commutata**, Engelm. Smooth; stems erect or ascending, umbellately or alternately branched; leaves thin, obovate, entire, the lower ones petioled, those of the branches round-kidney-shaped, sessile; involucres nearly sessile, shorter than the floral leaves; glands crescent-shaped or 2-horned; capsule smooth, round-angled; seeds ovoid, pitted. Dry soil, Aspalaga, Florida, and probably elsewhere, previously confounded with E. Peplus, L., which has a wing-crested capsule. Stem 6'-12' high. Leaves $\frac{1}{2}'-1'$ long. Plant pale green.
- 5. **E.** obtusata, Pursh. Smooth; stem erect; branches 3-5; leaves sessile, serrulate, obtuse; those of the stem wedge-oblong, of the branches ovate; involucre nearly sessile; glands oval; capsule round-angled, warty; seeds smooth. (E. Helioscopia, Ell.?) Shady woods, South Carolina, and northward. July-Sept. Stem 1° high. Leaves 1' long.

++ Perennials.

- 6. **E. Darlingtonii**, Gray. Stem tall; branches 5-8, forking; leaves entire, slightly pubescent beneath; those of the stem oblong, of the branches oval or roundish, obtuse, truncate at the base; involucres nearly sessile; glands obliquely oval; capsule obscurely warty; seeds smooth. Mountains of North Carolina, and northward. July. Stem 2°-4° high.
- 7. E. Floridana, n. sp. Smooth; stem erect; branches 3-4, forking; leaves entire, sessile; those of the stem linear or linear-lanceolate, mostly acute, reflexed; of the branches cordate-ovate, clasping, acute; involucres short-pedicelled, green, with the ovate lobes nearly entire, much shorter than the truncate crenate stalked glands; capsule acute-angled, and, like the seeds, smooth. Dry

EUPHORBIACEÆ. (SPURGE FAMILY.)

pine barrens, Middle Florida. June-Aug. — Stem 1°-2° high. Branches the more sterile plants successively forking and widely spreading. Leaves 1'-long.

- 8. **E.** inundata, Torr. Smooth; stem erect, 3-branched or alternated branched from near the base, few-flowered; leaves erect, lanceolate, entire, acut sessile; those of the branches oblong-ovate, clasping; involucre long-peduncle reddish, the pubescent lobes 3-toothed; glands orbicular, peltate, entire; capsule acute-angled, smooth, like the globose seed. Pine-barren swamps, Florida April June. Stems 6' 12' high, from a thick woody root. Leaves 2' 3 long.
- 9. **E.** telephioides, n. sp. Smooth and somewhat fleshy; stem thick branches 3, short, forking; leaves of the stem large, oblong-obovate, obtuse erect, with membranaceous margins; those of the branches small, ovate, clasp ing; involucre purple, slender-stalked, the lobes ovate, entire, ciliate, incurved glands peltate, roundish, entire; capsule acute-angled, smooth; seeds smooth.— Low sandy pine barrens near the coast, West Florida. May and June. Plant light-green, 2'-5' high. Stem-leaves 2'-3' long, often longer than the branches. Floral leaves 4''-6'' long.
- * * Stem erect, successively forking: leaves commonly opposite: involucres in the forks dark purple: glands 5, without appendages: perennials.
- 10. **E.** Ipecacuanhæ, L. Stems several from a long perpendicular root, slender, commonly forking from near the base; leaves of the stem and branches similar, opposite, or the lowest rarely alternate, entire, obtuse, varying from linear to round-obovate, short-petioled; peduncles slender, mostly longer than the leaves; involucre small; capsule slender-stalked, nodding, round-angled; seeds minutely pitted. Dry sandy soil, Florida to Mississippi, and northward. May and June. Stem 2'-12' high. Leaves $\frac{1}{2}$ '-1' long.
- 11. **E. nudicaulis,** n. sp. Smooth; stems slender, forking above; leaves minute $(\frac{1}{2}" \log)$, oval or obovate, the lowest alternate, those of the branches opposite; involucres minute, on short peduncles; glands top-shaped. Low pine barrens, near St. Joseph's, West Florida. June. Stems 1° high. Capsule and seeds unknown.
- * * * Branches and leaves alternate: involucres terminal, clustered or single: glands without appendages.
- 12. E. cyathophora, Jacq. Annual, smooth; stem erect, branching from the base; branches elongated, leafy at the summit; leaves petioled, oblong, fiddle-shaped, toothed or entire, the uppermost deep red at the base; involucres clustered, short-stalked, with 5 incised lobes and a single gland; capsule smooth; seeds globose, warty. Var. graminifolia (E. graminifolia, Michx.) has the leaves all linear and entire. South Florida, and around dwellings, apparently introduced. May Oct. Stem 1° 2° high. Leaves 2′ long.
- 13. E. trichotoma, H.B. K. Shrubby; stem irregularly much branched, very leafy; leaves small, imbricated, oblong-obovate, acute, obscurely crenate, sessile; involucre solitary, top-shaped, sessile; glands 5, peltate; capsule smooth, short-stalked. South Florida. Stem low. Leaves 3"-4" long.

EUPHORBIACEÆ. (SPURGE FAMILY.)

403

- § 2. Leaves stipulate, all opposite: glands of the involucre 4: annuals.


 * Stems erect or ascending: seeds 4-angled, transversely rugose.
- 14. E. hypericifolia, L. Smooth throughout; stem (½°-1° high) erect; branches alternate, 2-ranked; leaves (½′-1′ long) petioled, lanceolate-oblong, oblique and obtuse or acute at the base, equally serrulate on both margins; stipules reflexed; involucres in dense lateral long-peduncled cymose clusters; appendages of the glands white, kidney-shaped; capsules rather acutely angled, appendages of the glands white, Florida. Var. communis, Engelm. Stem often pubescent, ascending (1°-1½° high); oblong or lanceolate, obtuse or cordate at the base, often blotched with red, sharply serrate on the lower margin, entire below the middle on the upper; clusters terminal; appendages of the glands rounded, entire; capsule round-angled, smooth; seeds larger, nearly black. Cultivated grounds, Florida, and northward. Aug. and Sept.
- 15. E. pubentissima, Michx. "Perennial, erect, very pubescent; stem somewhat dichotomous; leaves opposite, sessile, oval, slightly cordate, obtuse; peduncles solitary; interior segments of the involucre (glands) white." Minedux.—"Pine barrens in the middle districts of Georgia and Carolina.—

 chaux.—"Pine barrens in the middle districts of Georgia and Carolina.—

 Leaves nearly 1' long. Flowers in the forks; peduncles nearly as long as the leaf." Elliott. (*)
- 16. **E. glabella**, Swartz? Stem stout, smooth, ascending, alternately branching or forking from the base, purple; leaves very numerous, somewhat fleshy, nearly sessile, oblong-ovate, cordate, acute, entire, with the margins involute, the uppermost crowded; involucres in dense terminal clusters; glands pellute, the uppermost crowded; involucres in dense terminal clusters; glands pellute, orbicular, bordered by a white appendage; capsule smooth, acute-angled; tate, orbicular, bordered by a white appendage; capsule smooth, acute-angled; seed bluish, faintly rugose. Sandy sea-shore, South Florida. Stem 1° high. Leaves 3"-5" long. Stipules fringed.
- 17. **E. pilulifera**, L. Pubescent; stem erect, forking from the base; leaves short-petioled, oblong-ovate, oblique, acute at each end, serrate; involucres minute, in dense terminal short-stalked clusters; glands without appendages; capsule acute-angled, hairy; seeds faintly rugose. South Florida. Stem 4'-6' high. Leaves 5"-8" long.
- * * Stems prostrate, diffuse: leaves small: involucres small and mostly crowded near the summit of the branches.
- 18. **E.** maculata, L. Pubescent; leaves oblong, serrate, oblique at the base, petioled, often blotched with purple; stipules 2-parted; capsule acuteangled, hairy; appendages of the glands transversely oblong, white; seed 4-angled, smooth, faintly wrinkled or pitted on the concave sides. (E. depressa, angled, smooth, faintly wrinkled or pitted on the concave sides. (E. depressa, angled, smooth, faintly wrinkled or pitted on the concave sides. (E. depressa, angled, smooth, faintly wrinkled or pitted on the concave sides. (E. depressa, angled, smooth, faintly wrinkled or pitted on the concave sides. (E. depressa, angled, smooth, faintly wrinkled or pitted on the concave sides. (E. depressa, angled, smooth, faintly wrinkled or pitted on the concave sides. (E. depressa, angled, smooth, faintly wrinkled or pitted on the concave sides. (E. depressa, angled, smooth, faintly wrinkled or pitted on the concave sides. (E. depressa, angled, smooth, faintly wrinkled or pitted on the concave sides. (E. depressa, angled, smooth, faintly wrinkled or pitted on the concave sides.)
- 19. E. inæquilatera, Sonder. Smooth; leaves oval or obovate, oblique and acute or obtuse at the base, obscurely serrulate, petioled; stipules ovate, entire or sparingly short-fringed; appendages of the glands white, transversely entire or sparingly smooth, acute-angled; seed 4-angled, granular-roughened and oblong; capsule smooth, acute-angled; seed 4-angled, granular-roughened and faintly wrinkled on the sides. South Florida. May Oct. Stems 6' 12' long. Leaves 2" 5" long.
- obtuse, cordate or truncate and oblique at the base, supplies speeder deeply obtuse, cordate or truncate and oblique at the base, supplies speeder deeply obtuse, cordate or truncate and oblique at the base, supplies speeder deeply obtuse, cordate or truncate and oblique at the base, supplies speeder deeply obtuse, cordate or truncate and oblique at the base, supplies speeder deeply obtuse, cordate or truncate and oblique at the base, supplies speeder deeply obtuse, cordate or truncate and oblique at the base, supplies speeder deeply obtuse, cordate or truncate and oblique at the base, supplies speeder deeply obtuse, cordate or truncate and oblique at the base, supplies speeder deeply obtuse, cordate or truncate and oblique at the base, supplies speeder deeply obtuse, cordate or truncate and oblique at the base, supplies speeder deeply obtuse, cordate or truncate and oblique at the base, supplies speeder deeply obtuse, supplies speeder deeply obtuse, cordate or truncate and oblique at the base, supplies speeder deeply obtuse, and cordate or truncate and oblique at the base, supplies speeder deeply obtuse, and cordate or truncate and oblique at the base, supplies speeder deeply obtuse, and cordate or truncate and oblique at the base, supplies speeder deeply obtuse, and cordate or truncate and oblique at the base, supplies speeder deeply obtuse, and cordate or truncate and oblique at the base, supplies speeder deeply obtuse, and cordate or truncate and oblique at the base, supplies speeder deeply obtuse, and cordate or truncate and oblique at the base, supplies speeder deeply obtuse, and cordate or truncate and oblique at the base, supplies speeder deeply obtuse, and cordate or truncate and oblique at the base, supplies speeder deeply obtuse, and cordate or truncate and oblique at the base, supplies speeder deeply obtuse, and cordate or truncate and oblique at the base, supplies and cordate or truncate and oblique at the base, supplies and oblique at the base, supplies and cordate or truncate and oblique at the ba
 - 21. E. polygonifolia, L. Smooth and somewhat fleshy; leaves oblong or linear-oblong, entire, oblique, obtuse or slightly cordate at the base, petioled; or linear-oblong, entire, oblique, obtuse or slightly margined by the stipules by pairs, 2-3-parted; glands of the involucre slightly margined by the narrow appendages, rather shorter than the subulate obtuse lobes; capsule narrow appendages, rather shorter than the subulate obtuse lobes; capsule narrow appendages, rather shorter than the subulate obtuse lobes; capsule narrow appendages, rather shorter than the subulate obtuse lobes; capsule narrow appendages, rather shorter than the subulate obtuse lobes; capsule narrow appendages, rather shorter than the subulate obtuse lobes; capsule narrow appendages, rather shorter than the subulate obtuse lobes; capsule narrow appendages, rather shorter than the subulate obtuse lobes; capsule narrow appendages, rather shorter than the subulate obtuse lobes; capsule narrow appendages, rather shorter than the subulate obtuse lobes; capsule narrow appendages, rather shorter than the subulate obtuse lobes; capsule narrow appendages, rather shorter than the subulate obtuse lobes; capsule narrow appendages, rather shorter than the subulate obtuse lobes; capsule narrow appendages, rather shorter than the subulate obtuse lobes; capsule narrow appendages, rather shorter than the subulate obtuse lobes; capsule narrow appendages, rather shorter than the subulate obtuse lobes; capsule narrow appendages, rather shorter than the subulate obtuse lobes; capsule narrow appendages, rather shorter than the subulate obtuse lobes; capsule narrow appendages are shorter than the subulate obtuse lobes; capsule narrow appendages are shorter than the subulate obtuse lobes; capsule narrow appendages are shorter than the subulate obtuse lobes; capsule narrow appendages are shorter than the subulate obtuse lobes; capsule narrow appendages are shorter than the subulate obtuse lobes; capsule narrow appendages are shorter than the subulate obtuse lobes;

IISSOURI OTANICAL A R D E N

2 3



No. 247. Euphorbia Parryi n. sp. Annual, erect, slender, pale-green, glabrous, with dichotomous spreading branches; leaves linear, nearly equal at base, acutish or acute at both ends, with setaceously slit stipules; involucres campanulate, on moderately long peduncles in the forks of the branches, with unequal small truncate appendages; styles short, somewhat erect; capsule sharp-angled; seeds ovate, minutely granulate. - St. George, in loose drifting sand. Plant about a span in height; leaves 1-1 inch long, ½ line wide, rolled inward when drying; involucres ¾-1 line long, and with the greenish-white appendages of the same width; stamens numerous, with conspicuous feathery bracts between them; styles about the length of the ovary; seeds 3 line long, rather thick, obtusely angled, surface covered with minute granules, disposed in transverse lines. Habit very similar to E. revoluta Engel., but this has a dark purplish-green color, revolute not involute leaves, very much smaller, slender turbinate involucres on short peduncles, and smaller, sharp-angled, strongly cross-ribbed seeds. The charac-len spiris points to an alliance with E. zygophylloides obviss. Amer haturelest 9. (Ime 1875).
Parry's What Plants

0 1 2 3 4 5 6 7 8 9 10 cm copyright reserved

MISSOURI BOTANICAL GARDEN

ERRATA.

Page 16, 13th line from bottom, for Phacelia crassifolia Torr. read Phacelia pulchella n. sp.

Page 16, 7th line from bottom, for Phacelia curvipes n. sp. (?) read Phacelia cephalotis

n. sp.

Page 16, 6th line from bottom, for P. Palmeri Torr. read P. integrifolia Torr.

Page 18, 10th line from top, for Culochortus read Calochortus.

Page 18, 18th line from top, for Capillus-venesis L. read Capillus-Veneris L.

Page 20, 15th line from bottom, for polygalvides read polygaloides.

Page 201, 11th line from bottom, for Trifolium Bolanderi read Trifolium Kingii.

[Printed at the SALEM PRESS, June, 1875.

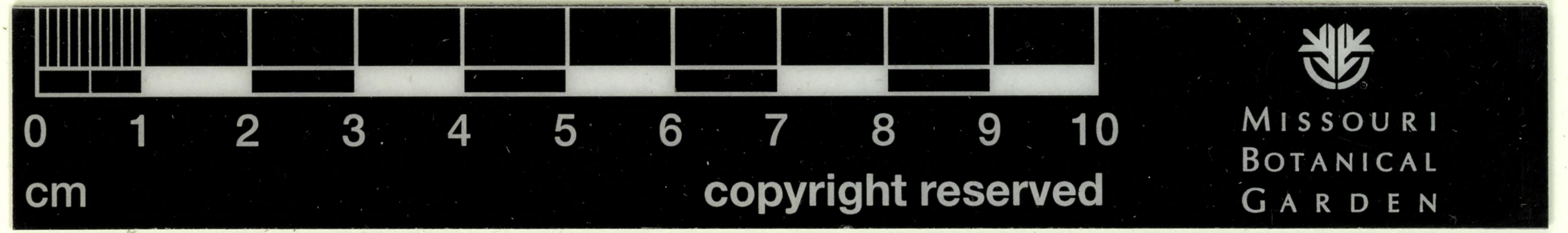
MISSOURI BOTANICAL GARDEN GEORGE ENGELMANN PAPERS

6436

0 1 2 3 4 5 6 7 8 9 10 cm copyright reserved







tive that it be pure—unspotted, that is to say, ny of the meal that may lie on the edge beyond on the paste within. Colours also should true and fast—not fading into weaker shades the other parts of the flower grow old.

last remaining portion of colouring on the is that wonderful circle of green, or grey, te, that bounds the blossoms, and determines nature the class to which a variety belongs. gather into one word that important point, are which the flowers of all the classes should ion to all their zones, and that single word is e. Taking the pistil as the centre, then across If-flower as a radius-line, the tube, paste, body, edge, should be in the proportion of equal hs. The tube should be bold, with highlyped anthers, and the paste quite its full breadth; ndeed, in the case of the selfs, rather over that, them the body colour really represents two and therefore for good balance the paste should ent rather more than one, or the flower will leavy. Body colours flash towards the edge, e not to run out at the petal-corners, or an r look is the result. However, the body should nsist of only flashes, but have a solid foun--ring, the more solid the better. Where this so, the pencilled work has a thin and scratchy ance.

CULTURE.

to the culture of the florist's Auricula, it is not the province of this lecture to give you a ete calendar of cultural operations. But it is ng for a moment to peep into the potting-sheds old masters. It was a school of cookery for luricula, in which the plants themselves were victimised. The compost-heaps were not so an honest provision-shop for the flower, as its tioner's or druggist's, where it was forced either ke itself ill with sickly sweets, or was overdosed dire stimulants, till after a flash of burning, ful life, it died. One professor of long ago, ig in dialogue, conducts a horrified neophyte his compost-yard, where the young beginner is letely upset by an inspection of horrible effects the slaughter-house, sugar-refinery, and other es of resuse. "Our compost," says the master, a vile compound, "is now in fine killing order; uld poison an Oak tree!" No; cut for your s a few sods from a pasture which the buttercups tell you is sound and rich; ramble in the woods, instead of a cornucopia of wild flowers, bring what you can carry of mellow leaf-mould; ask gardener for a slice of the hot-beds that grew last 's Melons or Cucumbers; make about equal parts of ou have, with, say, charcoal to keep it open, and have all the Auriculas will care to ask for. As

New Garden Plants.

MILTONIA, LAMARCHEANA, n. hyb.*

This was published and figured in 1876 as Miltonia Clowesii (Lindl.) Lamarcheana, in the Belgique Horticole, by Professor E. Morren, p. 174, pl. xiii. I have at hand a beautiful inflorescence coming from the excellent collection of Mons. Massange de Louvrex, Château de St. Gilles, Liège, grown by M. Kramer, the Japanese and Costa Rican traveller. The general habit of the inflorescence is that of Miltonia candida. The sepals and petals are broader and less acuminate than in M. Clowesii, light yellow, with broad cinnamon bars. The lip is cordate at the base, abruptly broader from the middle, forming a semiovate, a little wavy body, with an apiculus. At the base of the lip is an obscure globular tumour, as in M. candida, Lindl, yet not so well developed. Seven keels stand on the forepart of the lip, the central one being bisid in front. The lip is whitishochre, with a broad pandurate blotch before the keels. The column would be that of M. candida if the androclinium (anther bed) had a membranous border and cucullus. This is not the case. The tabula infrastigmatica is quite as projecting at the top as in Miltonia candida, not so constricted as in Miltonia Clowesii. The narrow wings are violet, the middle of the tabula infrastigmatica orange, all other parts whitish ochre. My opinion is, that the plant may be a mule between M. candida and M. Clowesii.

According to Professor E. Morren, this curiosity flowered in August, 1874, in the garden of M. Oscar Lamarche de Rossius, Prèsident de la Société Royale d'Horticulture de Liège. It was grown by M. Francois Rosier. H. G. Rchb. f.

KEFERSTEINIA MYSTACINA, WASP. TEN

This is a very curious new Kefersteinia, having the general habit of the common K. graminea. The flowers are yellowish-green, as also is the blade of the lip. The callus and stalk of the lip are white, with purple dots, as well as the column. The chief and very curious feature lies in the blade of the lip, which is broken up into numerous fringes, which are quite peculiar. It was discovered at St. Alban's, Hertfordshire, at Mr. Sander's, under masses of Columbian Orchids sent thither by late poor Falkenberg, taken over to Zürich, and carefully brought to flower by Herr Consul Kienast-Zölly, who is inferior to nobody in enthusiasm for Orchid species, and even more so for their varieties. H. G. Rchb. f.

CYMBIDIUM EBURNEUM (Lindl.) WILLIAMSIANUM.

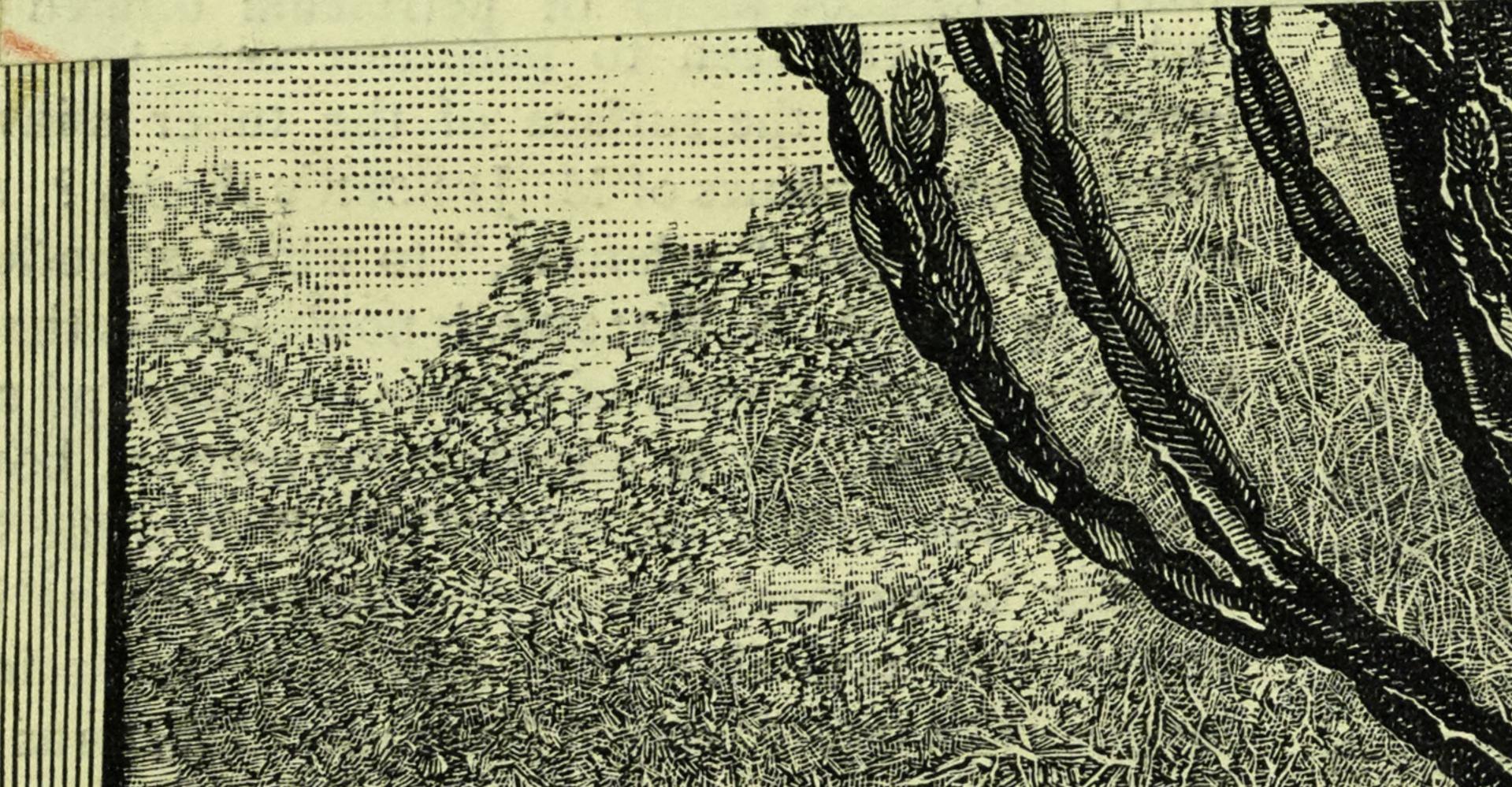
Is not Mr. B. S. Williams particularly lucky in this group of Cymbids? I have from the Victoria and Paradise Nurseries a lovely variety I never saw before, with a fine tip, showing the anterior lobe and lips of the side lobes light purple the force of the

doing. The Department arranges the Coue, w. course, the sanction of Parliament, and by the when approved, all school authorities are bound schools of an elementary kind are continge existence almost as much upon the grant earn upon rates or other means of income. This gi given for results obtained by attendance throug year, and by passes in reading, writing, and metic. It is therefore of the first importance these subjects should have full prominence. remain, in the way of securing additions t grant, certain special subjects, of which mor taught in towns, where the average intelliger higher, and fewer in the rural districts, where always lower. The most common of special su are grammar, geography, and history—all dr somewhat monotonous topics—whilst, unde Science and Art Department, drawing may be a In addition to these, girls have needlework special subject, and very considerable is the an of time taken from intellectual training in this and pottering with khitting, samplers, &c., mi the mental detriment of the children. So much, fore, has to be compressed into the few hours that the school is open that there is no time for subjects; and it is obvious that until some pres put upon the Department to change the Code as relates to the subjects taught, very little c done in teaching elementary science, or simpl jects such as are indicated in your leader.

In respect to teachers, so much is demanded them in knowledge of ordinary subjects that it in towns, where there are provided special te and centres for science learning, they can acqui knowledge concerning them. A pupil-teache pass severe examinations in reading and m exercises, in English grammar and compositi arithmetic and mathematics, in geography, h and music, and, where possible, drawing, an show great proficiency in class teaching. H also go in for some foreign language. Whe understood that all this knowledge has to be ac before or after school hours, and the drudg several hours' teaching has exhausted th energies, it can be easily realised that teac training have little spare time, or disposition, up in scientific topics. To compress more into the ordinary school hours of children is sible; and therefore what is wanted is a rement of the Code, so that subjects likely to r real value to learners in after life may be sul for others that are less important. But re endeavoured to impress my own school colleagues with the advantages drawing p over history, but was met with the stolid of that history—for school history consists of 1 1-1-1-1-ledge of dates—is good training



first sight to realise that the plant here represented (fig. 112) can be a near ally of the common Spurges of our fields and woods. Nevertheless, an examination of the flowers would at once show the real affinity of the plants. It affords an excellent illustration of the fact, well known to botanists, that what gardeners call habit, or general appearance, is very often extremely misleading. Most persons would probably consider this to be a Cactus of some sort—an illusion which would of course be instantly dispelled were the flowers visible. In doubtful cases a prick of a pin is sufficient to show the difference, for if it be a Euphorbia a milky juice at once exudes from the puncture, while if it be a Cactus the fluid is transparent. Those more concerned with picturesque effect than with botanical affinity will see much to admire in the quaint aspect of the plant, well shown in our illustration. When growing in its native locality the tall, stiff candelabra-like trees shoot up from amid the bare rocks of Teneriffe, fringing the edges of the precipices, and adding to the weird appearance of the scene. The effect produced may be, in considerable measure, judged of by a visit to the Succulent-house at Kew, one end of which is occupied with fine specimens of the present plant, and several of its near neighbours. The contrast it affords with arborescent vegetation and with the stiff, bold foliage of the Zamias is shown in our illustration, prepared from the photograph of a plant growing in the Botanic Garden of Cape Town, and for which we are indebted to the Director, Mr. McOWAN.



The Handy

TAKE advantage of the fine the pruning and training of si lost their foliage. At present Cherries, and Currants. In t. if summer pruning has been a there will only be left the think overcrowded, and the shortening project too far from the wall. be trained to replace any bra Extension shoots should be la cutting away the unripe extren the others back to secure an and to produce fruit-bearing spui for the formation of the tree produce their fruits in a mann trees, on the young growths of t therefore the pruning will cons portions of the old bearing we with the young growth laid in mer, also having in view the k well supplied with young wood overcrowding, the fruit will be the wood more persectly matured Trees that cover the whole surface should have the extreme shoots cut below them. Where the trees were all the old nail-holes and crevices in be stopped, and all old shreds ren trees and walls should then be dress ticide either of tobacco-water or p



0 1 2 3 4 5 6 7 8 9 10

Copyright reserved

GARDEN

MISSOURI
BOTANICAL
GARDEN

medium of dry specimens brought from foreign intries, that there are no fewer than about 100,000 ferent flower-bearing plants. At a liberal estimate number of plants which could be said to be of ect service to mankind would not amount to more in 10,000. There would be 500 different kinds of it trees, then all sorts of vegetables, trees supplying iber, and plants which give material for the manuture of clothing—cotton, hemp, flax, and so on. le greater portion of the remainder of the plants re ornamental, but to his mind every bit as useful the economic ones. As nearly as he could estimate ere might be some 5000 plants which were more less poisonous and hurtful, some of them very much d others only moderately so. The most important t of all was that a large proportion of the deadly nts with which we are acquainted are admirable dicines in the hands of a clever physician who ows how to administer them in proper quantities d at proper times. We may, therefore, look upon isonous plants and accept them as the good gifts of ovidence, intended to be applied to certain purposes, . BRUCE FINDLAY will read a paper on "A plant, lat is it?" at next Thursday's meeting.

THE "COVENT GARDEN" LIFEBOAT. the 3d of the present month the new "Covent irden" lifeboat was launched with great success presence of the Mayor of Yarmouth and a large mpany of friends and supporters of the Lifeat Institution, including Mr. T. A. DICKSON, Mr. R. BUCK, Mr. S. J. PALLANT, Mr. C. DENTON, d Mr. J. Webber, members of the Covent Garden mmittee, of which Mr. WEBBER was the Honorary cretary, and who, in the name of the committee, nded over the new lifeboat into the keeping of the rmouth and Caister Branch of the National Lifeat Institution, with the remark that he was sure boat would be safe in their keeping, and would launched whenever a signal of distress was obved. The Mayor, on behalf of the lifeboat comttee, thanked the Covent Garden committee for eir munificence. He assured them that the new at would be perfectly safe in the hands of the ister beachmen, than whom a braver set of men not exist on the coast.

-- FUNGI ON FOREIGN GRAPE VINES IN IERICA.—The following very interesting communiion has been received from Dr. TAYLOR of the epartment of Agriculture, Washington, dated tober 28:-"This summer, and at this moment, o foreign Grape Vines of 100 varieties are, so to v, covered with the perithecia of an erysiphoid igus of which I enclose specimens. I am fully rare that many of the American varieties and some the species have the form Uncinula on them, but I n not aware that any one has ever found any form, bgenus, or species of this character on the foreign rape Vines. You are, I suppose, aware that in orth America the foreign Grape Vine is grown holly under glass structures. The Oidium Tuckeri quite common on the foreign Vine. Within twelve ars our foreign Vines were affected alike. I have itched each year since 1871 but no perithecia were en." On examination of the specimens we find the ncinula, as far as we can see, to be identical with spiralis, BERK. and CURTIS, having the same long pendage, the tips of which are distinctly spiral os and not merely hooked. This species was sent us by Mr. Curtis on leaves of Vitis Labrusca. As as we are aware, like Dr. TAYLOR, no peritheum has ever been developed on European Vine, on hich the Oidium is so common and destructive. yenidia have been found by AMICI, but no periecia. It is, therefore, certainly curious that rithecia should have developed in America under ass, and still more so that it should be a specimen nich occurs on the well known Vitis Labrusca. As at Uncinula is not known in Europe we cannot that it arises from the historical Oidium

the broad handsomely bipinnate leaves in the fading autumn months is more suggestive of the robust and vigorous growth of summer. Although individually small, these flowers in the aggregate at some little distance resemble the snowy masses of such as Spiræa Lindleyana, or S. ariæfolia. The plant is perfectly hardy and deciduous, but retains its beautiful foliage till late in the season, and whether in flower or not, deserves a prominent place in the shrubbery; and were it not for its naked stems in winter, it would constitute a bold and telling specimen for the lawn. These stems, being straight and unbranched in the young state, present the singular appearance of stakes stuck in the ground. The plant is also known as Aralia chinensis, and together with some others forms a subgenus or section of the large and varied genus Aralia. GEORGE ENGELMANN PAPERS

—— COPROSMA LUCIDA. — Outside of botanic gardens (with the exception of C. Baueriana and its variegated varieties) the members of this genus seem little if at all known. Several species have been introduced from New Zealand, and are so hardy that C. Baueriana and C. Cunninghamii will live, and even flower, under the protection of a wall. The flowers are small and insignificant, for which the leathery evergreen leaves are some compensation; but their chief value from a horticultural point of view lies in those sorts having variegated foliage, or, as in the present instance, having highly coloured and attractive berries. In the winter garden at Kew a large plant is conspicuous amidst the surrounding greenery by its clusters of small scarlet berries, which seem to weigh down the small twiggy shoots by their abundance. This it seems to do annually with a regularity that would make it worth the general cultivator's attention as a conservatory plant.

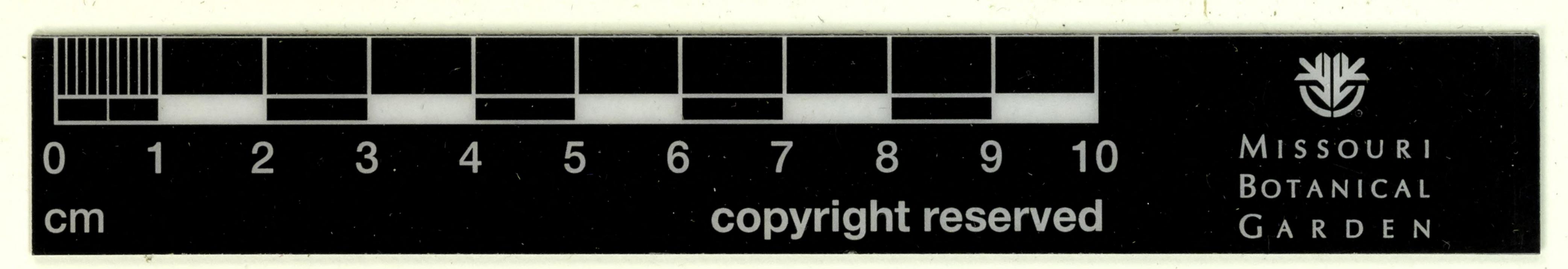
— MR. WILLIAM FALCONER.—The American Gardeners' Monthly sympathises with the Cambridge (Mass.) Botanic Garden on its loss of Mr. WILLIAM FALCONER, its Curator, who is reported to have been engageá by Mr. CHARLES A. DANA as his gardener at Glen Cove. Many of our readers will remember Mr. FALCONER as a young man of great promise who was well known to horticulturists in London a few years ago, and whom they will wish all success in his new undertaking.

--- ANEW RACE OF WINTER HLOWERING CARNA-TIONS.—This remark may be correctly applied to a group of Tree Carnations exhibited by Messrs. HOOPER & Co., Centre Row, Covent Garden, at the meeting of the Floral Committee at South Kensington on the 13th inst. There were so ne three dozen plants of the following varieties: - Irma, bright purplish rose; Purity, white; Zouave, deep crimson; and Jean Sisley, sulphur, flaked crimson and rose. They are of the dwarf, free-branching type known as A. Allegatière, but in some respects dwarfer, and singularly free of bloom; and it would appear that they can be easily grown in pots, the bulk of the plants shown being from cuttings struck in the spring, and some of them—the larger and taller—being two years older. That such fine bushy, vigorous plants should have been produced in the space of eight or nine months speaks volumes in favour of their free growth; and they were full of bloom, and with numbers of successional buds showing themselves. This race will be found of much value for autumn and winter cultivation, and with them there will be no difficulty in having blooms of Carnations all the year round.

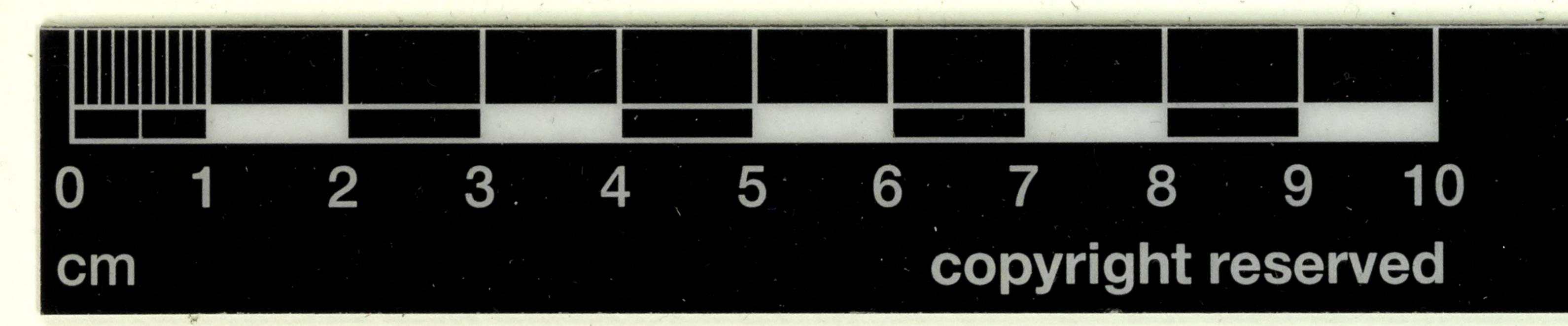
THE WEEK.—Now that the Apple Congress is over, and that the special Chrysanthemum shows absorb the interest in those flowers, it might be thought that the last meeting of the Royal Horticultural Society would have been, to say the least, flat. Nothing, indeed, can be imagined more dreary than the smarty balls so recently devoted to the "Fisheries"

there is no doubt whatever that the luminousness brilliancy of the flower is enhanced by allowing yellow disc to be seen. Of course florists wil agree to this, nor will they or ought they to asser the ragged, unsymmetrical ray florets; but if M CANNELL's forecast be true, improvements in particulars will soon be forthcoming.—The new p exhibited by Messrs. VEITCH & BULL were, as always are, of interest to the few. It may be fi ten years before the great British public car brought to see their charms. The great B public is a very incomprehensible body, and clearly not always an advantage to be before with it. "New Plants," described by our fores or by ourselves years ago and forgotten, come l the present generation; a furore is made, the services of those who have gone before ignored, and their results appropriated by no and brought out as new.—Hybrid Sarracenias a teresting no doubt, as all such productions are from a purely decorative point of view it is do whether some of the crosses are any improveme the originals. Still they are, or may be, the sti points of some new forms, and should be encou accordingly. It is another mysterious circums that the flowers of these plants should attract so attention, and yet they are to the full as extraord and even more attractive than the pitchers. day they will come to the front as something quite -With regard to the Potato disease, it was po out at the Scientific Committee that the tubes en from the bud-spores (conidia) could not, or at had never been seen to penetrate the thick, layer, by which the surface of the tuber is inve What, then, becomes of M. JENSEN's theory? A as to the alleged "sclerotia," to which attentio called by Mr. A. S. WILSON, it now appears that bodies are only masses of oxalate of lime, and so another theory. It is a subject for inquiry, how whether the calcic oxalate may not in some w another be connected with the fungus, for it is known that crystals of this substance occur in sungi.—The rediscovery of Narcissus viridissorus b MAW is also a matter of considerable interest, a alluded to elsewhere. — The Grapes shown by Mr. were wonderful for size, but we do not think would grow Colmar for flavour if they could get thing else.—Chrysanthemum shows are the order day, and they afford something to look at fo florist pure and simple, as well as for the lov fancy flowers and morphological curiosities. diverse utility of the Chrysanthemum, from Ju January, is one of the special points in its favor At the dinner of one of the City companies, unconnected with horticulture, the guests insulted by being presented with calico Rose their buttonholes. We have every wish to encou honest industry, but when it comes to wearing c Roses when fresh flowers may be had, it is tim the horticulturists to protest. Better nothing a than such abominations.— The lectures on Diseases are alluded to elsewhere as a step in right direction.—Mr. FINDLAY may well think successful Apple show, held under his manageme Manchester, is a similar step in advance; and la we are glad to chronicle the fact that the ! national Forestry Exhibition, in Edinhurgh, is to be a great success.—The question whether country ought or ought not to become a party t Phylloxera Convention is well worthy of careful sideration by our nurserymen. In the meanting do not deserve the castigation administered b Gardeners' Monthly, who assumes that this co has entered the Convention. The Gardeners' Mo ought to know that no one has been more outst as to the folly and futility of the Phylloxera laws ourselves.

THE PARAGUAY FLORA. — M. MICHELI has recently issued a monograph Leguminosæ of Paraguay, mainly formally



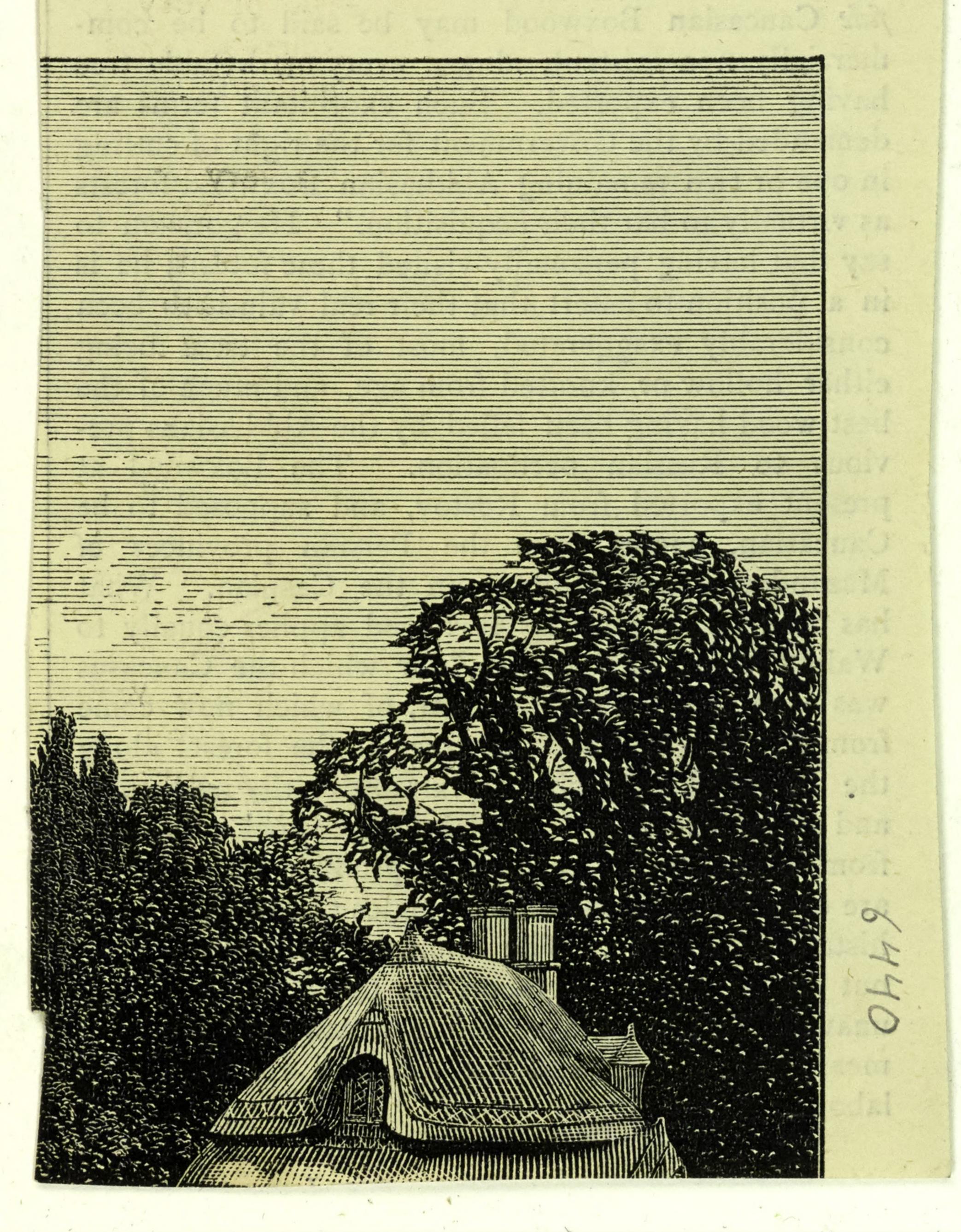
--- Boxwood IN Russia. --- Boxwood grown in the forests on the shores of the Caspian Sea is, it appears, a large article of trade with Russia. This wood reaches Astrachan and Nizni-Novgorod in the spring of the year, where it is sold during the fair. Last year the quantity so sold was about 130,000 poods, being about 80,000 poods in excess of other years. It is pointed out in a recent report that the increased demand for this Boxwood, which is used for shuttle-blocks, indicates increased prosperity among Russian manufacturers. On the subject of boxwood the acting British Consul at Tiflis writes: - "Bonâ fide Caucasian Boxwood may be said to be commercially non-existent, almost every marketable tree having been exported. Such exorbitant terms are demanded by the Government for the right of cutting in one or two remaining Abkhasian Boxwood forests as virtually to bar their acquisition." He goes on to say that having personally visited these forests, he is in a position to assert that their real value has been considerably exaggerated, most of the trees being either hollow or knotted from age, and much of the best wood having been felled by the Abkhasians previous to Russian occupation. The Boxwood at present exported from Rostov, and supposed to be Caucasian, comes from the Persian provinces of Mazanderan and Ghilan, on the Caspian. What has been said respecting Boxwood applies equally to Walnut burrs, or "loupes," for which the Caucasus was once famous, 90 per cent. of which now come from Persia. The Walnut trees of the forests along the Black Sea, which are extraordinarily numerous, and afford excellent material for gunstocks, do not, from some climatic peculiarity, produce burrs, which are only found in the drier climates of Georgia, Daghistan, Persia, &c. The immense quantity of Walnut timber in the forests on the Black Sea is mostly unavailable from the complete absence of roads or means of transport, and the dearness and scarcity of labour. 0





of the front entrance, which is in the form of a round pavilion, and, being elevated on a stand, permits of visitors walking round and under its leaves. It is planted in a tub 3 feet high and 8 feet in circumference. The trunk is 5 feet in circumference and 3 feet high, with the cones, three in number, and each 18 inches long, on the top. The width across the leaves is 15 feet. It has been in the same place

GEORGE ENGELMANN PAPERS



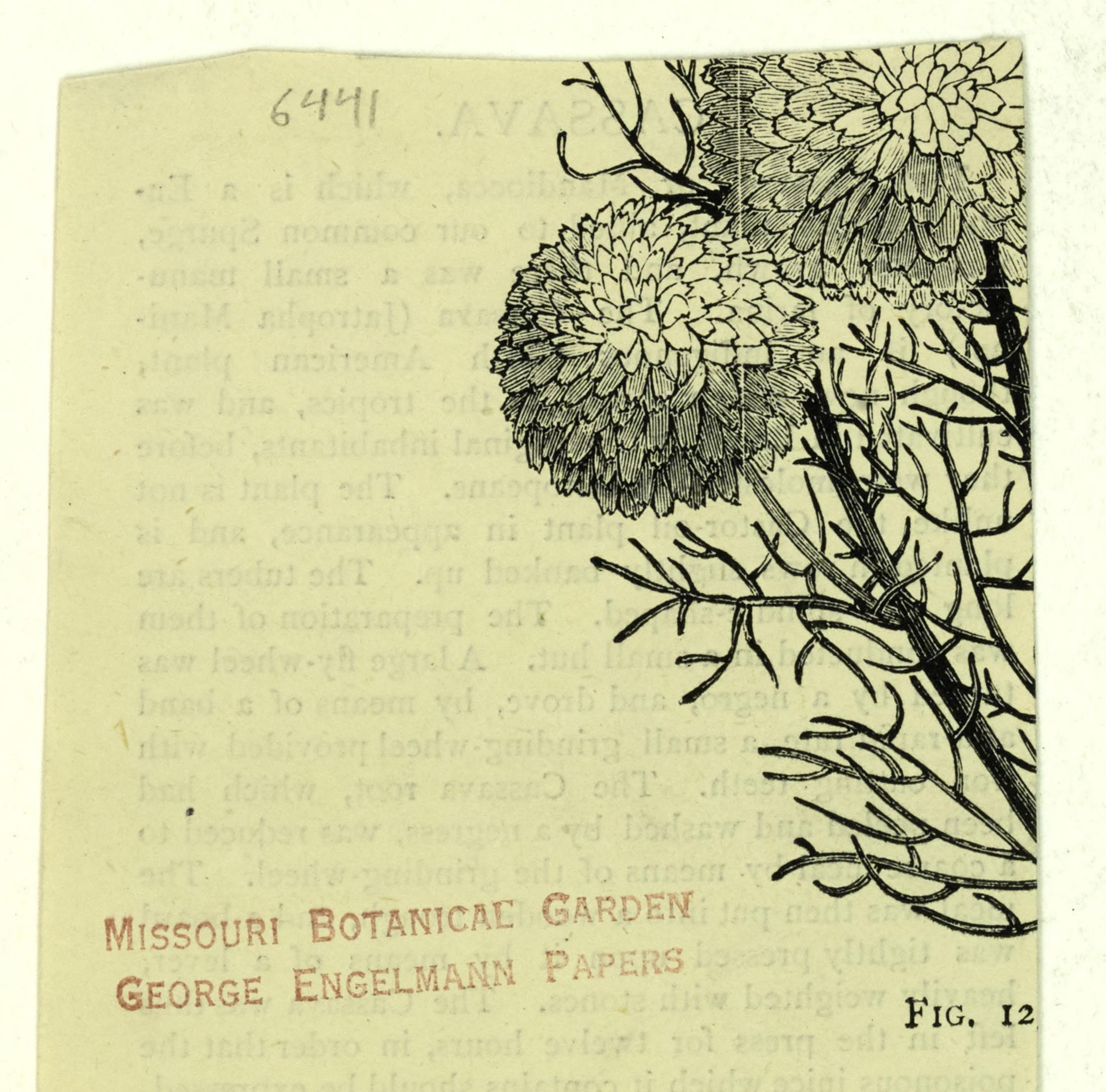
MISSOURI BOTANICAL GARDEN

0 1 2 3 4 5 6 7 8 9 10 cm copyright reserved

CASSAVA.

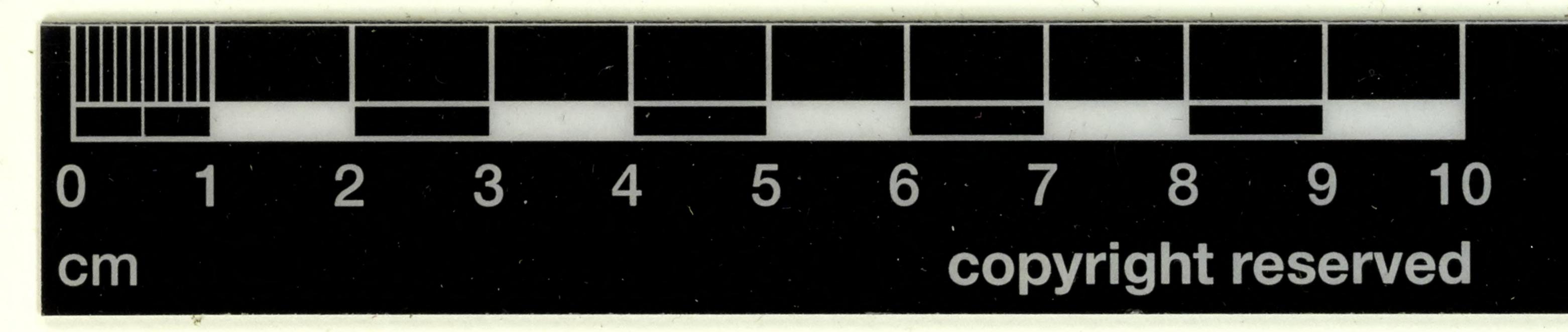
THE Cassava, or Mandiocca, which is a Euphorbiaceous plant, allied to our common Spurge, was also grown, and there was a small manufactory of farina. The Cassava (Jatropha Manihot) is an indigenous South American plant, though now widely spread in the tropics, and was cultivated in Brazil by the original inhabitants, before they were molested by Europeans. The plant is not unlike the Castor-oil plant in appearance, and is planted in rows slightly banked up. The tubers are long and spindle-shaped. The preparation of them was conducted in a small hut. A large fly-wheel was turned by a negro, and drove, by means of a band at a rapid rate, a small grinding-wheel provided with iron cutting teeth. The Cassava root, which had been peeled and washed by a negress, was reduced to a coarse meal by means of the grinding-wheel. The meal was then put into a wooden trough, and a board was tightly pressed upon it by means of a lever, heavily weighted with stones. The Cassava was thus left in the press for twelve hours, in order that the poisonous juice which it contains should be expressed. The meal was then taken out and dried on a smooth stone surface, beneath which a wood fire was burning. The resulting chalky-white meal when sifted yields samples of three degrees of fineness. The finest, a white flour-like powder, is tapioca, i.e., true original tapioca, an imitation of which made from Potato starch is commonly sold in England. The intermediate sample is used in starching clothes and in cooking; and the coarsest substance, which is coarser than oatmeal, and consists of irregularly-shaped dried chips of the roots, is called farinha, and is, as before described, commonly eaten with gravy at dinner taking the place of bread, and forming a staple article of food. Notes of a Naturalist on the "Challenger."

Gard. Chron Dec 13. 1879



in order to make any advance in the argument, we need to specify some particular in which the graft is affected by the stock—some quality which all will recognise. There is no distinction in Apples more generally and easily understood than that of sweet and sour. If a pleasant Apple, grafted on a tree bearing sour fruit, becomes more acid, we may say the sour stock affects it. If when grafted on a sweet Apple tree it becomes less acid, we say again the sweet stock affects it. The Porter well illustrates this. I will now name several of many cases which might be adduced, where the evidence on this point is direct, positive, and unmistakable. And here let me remark that this evidence was not given to

and the second of the second of the second of the second s





These included Streptocarpus caulescens, and several

Leguminosæ.

IV. Professor Dickson exhibited a specimen of Polemonium cœruleum from the garden of G. H. Potts, Esq., Fettes Mount, Lasswade. It had a broadly fasciated stem, with thickly clustered flowers along its edge-like extremity. This form seems to be permanent, as it has now come up for the second season at Mr. Potts'.

V. Professor Dickson also showed two exhibits sent by Mr. Brown—one a specimen of Cheiranthus Cheiri var. gynantherus; the other a proliferous Rose, where the second flower, instead of springing from the organic extremity of the floral axis, i.e., the bottom of the hollowed out receptacle, springs from its margin in the neighbourhood of the insertion of the corolla and stamens.

VI. Mr. Sadler exhibited a lithograph of a peculiarly branching Silver Fir grown at Conishead Priory, Cumberland, giving at the same time measurements of girth, &c.

VII. The following plants in flower were exhibited from the garden MISSOURI BOTHNICAL BARDEN

Aciphylla squarrosa ORGE ElGentiana ornata APERS Delphinium nudicaule Allium oreophilum Orchis hircina " maculata alba Dianthus alpinus Calceolaria Kellyana Androsace rotundifolia var. macrocalyx Primula floribunda Erinus alpinus Edraianthus caricinus

Silene quadridentata Lewisia rediviva Sarmienta repens Veronica Lyallii Polemonium humile Polygonum capitatum Goodyera repens Saxifraga propaginea ,, mutata

,, Guthrieana var.

Nottinghamshire Horticultural and Botanical.—The monthly meeting of the above Society was held on Monday evening last. There was a large attendance of members and their friends, and Mr. James Booth, of Fern House, Mapperley Road, occupied the chair. Mr. C. P. Pearson, of Chilwell, read a long and interesting paper on the "Pelargonium and its Culture," dealing with the plant from the first hybridisation of the common wild variety by the celebrated Donald Beaton down to the present beautiful varieties now in commerce. The reader illustrated his paper by exhibiting the different forms or stages of hybridisation by living specimens. A discussion followed, and a vote of thanks was awarded the essayist. There was a large show of cut flowers and fruit, especially noticeable being a very fine collection of named Pyrethrums from Mr. Pendry, of Car Colston, and a very fine netted Melon from Mr. Swanwick, of Sherwood Lodge. Mr. German, of Malvern House, brought some fine blooms of Cattleya citrina, Cypripedium Parishii, and Anthurium Andreanum, all of which were very much admired. The different exhibitors and the Chairman were accorded a hearty vote of thanks.

> Menhol whiling Foreign Correspondence.

A TRIP TO MALACCA: Tapioca Cultivation.— As Tapioca is now one of the principal articles of export from the Straits Settlements a few notes made during a flying visit I recently paid to Malacca regarding the mode of cultivation and the primitive and modern modes of manufacture there employed may not be uninteresting to some of your readers. During a six years' residence in the Straits I was never fortunate enough to have sufficient time to spare in Malacca to go far beyond the limits of the town, yet when one reflects on what Griffith, Thomas Lobb, Maingay, and others have unearthed from its jungles it has become to the botanist and naturalist the most interesting part of the Straits Settlements, and while driving along its country roads or traversing its jungle paths and reflecting on the work done by those lovers of Nature, one feels that he is on classic ground so far as botany is concerned.

It was, therefore, with no little satisfaction that I accepted an invitation from Mr. J. M. Lyon, who is the head of an engineering firm in Singapore that has acquired considerable local renown for its inventions for manufacturing Tapioca, to accompany him on a short trip to Malacca before leaving for "the land of the white elephant."

Leaving Singapore at 4 P.M. on September 14 by the steamship Mayflower—which, by-the-bye, is not the same craft which conveyed the "Pilgrim Fathers" from the shores of Old England "converted"—we arrived in Malacca (locally known as "Sleepy Hollow") at 9 A.M. next morning, and at once called on some of the principal Tapioca planters.

Before starting for the plantations we were treated to a surfeit of Malacca fruits, which at the time of our visit were abundant, including delicious Dukus (Lansium domesticum), the Tampui (Hedycarpus malayanus), which, I think, is much to be preferred to the Mangosteen, of which, of course, we saw plenty, and splendid Chikos (Sapota Achras), which, although it is not an indigenous fruit, thrives and fruits to perfection in Malacca.

Before noon, however, in company with two of the

most extensive and energetic planters in the colony, Mr. Chea Hoon Bong and Mr. Koh Hoon Boh, we were en route to their plantations.

To the estate of the former gentleman, which is about 10 miles from Malacca, the drive was very enjoyable, the sides of the road for some distance being mostly overshadowed with Cocoa-nuts, while underneath the Rambeh trees (Pierardia dulcis) were loaded with long hanging racemes of fruit, while large clumps of Salak (Zalacca edulis), Licualas, Bauhinias, Poinciana pulcherrima, Ixoras, &c., served to diversify the vegetation. Some fine native-grown Coffee was passed, laden with ripe fruit, and further on a thriving Nutmeg plantation was passed through. Further on, where the jungle road begins, there was little to interest--Rhodomyrtus, Grewias, Mussænda, and Melastoma forming the larger part of the vegetation.

The mode of cultivating Tapioca in the Straits varies but little on different estates, whether owned by Europeans or Chinese. If jungle composed of large trees is to be cleared the trees are cut down at some height from the ground, the stumps remaining in the ground and the whole set on fire, the charred remains of the trees being generally allowed to lie where they fall until the first crop is being cleared off, when they are utilised for fuel. After the ground has been dug over and the soil put into a friable condition the cuttings of Tapioca are planted in rows from 3 to 4 feet apart and about 9 inches or a foot in the rows. The cuttings are lengths about a foot long of the stem of the matured plant. These root easily, and in less than two months the ground is covered with a carpet of green almost a foot high. From this time to the time the crop is lifted, beyond weeding and slightly banking-up, nothing is done to the crop, although on some estates the tall stems are sometimes cut down to about 4 feet from the ground, which must evidently keep the plants in a growing state, and prevent the proper storage of starch. On some estates I have known the crop lifted nine months after planting, with good results; but the Chinese planters in Malacca usually keep the roots in the ground sixteen or even eighteen months. Perhaps each has its advantages, but it has struck me that tubers kept in the ground over a year develope a large amount of woody fibre without increasing the quantity of starch, which is evidently a disadvantage to the machinery. The general mode of lifting the crop is to cut off a certain portion of the tops, and pull up the tubers, the broken pieces being dug out afterwards. Of course, on land that has previously carried a Tapioca crop, manure should be used, which by some planters is applied previous to planting, and by others after the young plants have started into growth. In Malacca, however, cow-shed refuse is a scarce article, and the cost of carriage would be considerable where estates are distant from the base of supply and roads in many instances steep and bad.

On one estate in Singapore under European management a green crop is grown with the Tapioca, consisting principally of Arachis hypogæa, various Crotalarias, principally C. striata, &c., which is dug in with lime, &c., while green, for the next crop, but the plan does not appear to find acceptance with other planters. The root of the Tapioca it is hardly necessary to describe here, but I may state that while in Malacca I saw some specimens over 2 feet long, and weighing between 6 and 7 lb. The roots being laid in heaps are carted to the manufactory, and the sticks laid in stacks for supplying cuttings for the next crop.

The estate first visited in Malacca was Buki Bruang (literally Bear Hill), and here we found J. M. Lyon & Co.'s patent machinery in full working order.

Of course steam is the motive power, in fact the most primitive styles of preparation seem unable to do without this, as I will show later on. The roots being first divested of their woody tops, are thrown into a large revolving drum, in which pipes are so arranged that constant jets of water play on them as they are turned over and over, and gradually they reach the farther end of the drum perfectly clean, and empty themselves into a rasping machine, whence they emerge in the form of a fine pulp, which is thrown direct from the rasper into another cylinder covered either with stout muslin or brass-wire gauze, through the sides of which jets of water are continually passing. By this process the starch is separated from the pulp, the starch passing through the muslin or gauze

into a tank beneath, where further supplies of water send it off through gutters to vats prepared for its reception, while the pulp is discharged from the drum into baskets and thrown into heaps either for cattle feeding or manure, for either of which I imagine it is little suited.

6442

After the starch in the vats has been allowed to subside the water is gradually drawn off, fresh water supplied, the whole stirred up and again allowed to subside, and the water again drawn off. The treatment of the starch in this stage depends on the purity of the water used—as, unless the Tapioca when prepared is of the purest whiteness it can hardly be given away. Hence, one of the principal points to be attended to is the supply of clean water in abundance. After the starch has become sufficiently pure it is allowed to dry in the vats, whence it is cut out in cakes and is then ready for the last stages of preparation. If Tapioca flour is required it is placed first on racks to dry, then on large, almost flat tin sheets which form the top of a brick flue where an extremely gentle sire is kept up.

If flake Tapioca is requisite it is submitted to rather stronger heat in concave pans at first, whence it is removed to the previously mentioned sheets and kept turned over with wooden rakes, &c., until it assumes the flake-like form so familiar to consumers in Europe. The flakes are then sifted, to separate the various sizes, and the prepared Tapioca is ready for placing

in the bags for shipment.

After a liberal tiffin, for which we were indebted to the proprietor of the estate, Mr. Chea Hoon Bong, we started for an estate some 8 miles farther on belonging to Mr. Koh Hoon Boh (the name of which I have unfortunately forgotten), and as I have mislaid all my notes about our first day's trip I am obliged to fall back on memory for particulars.

Now commenced the real business of the day. The road from Bukit Bruang to this estate is in some places so steep and bad that only light traps are available, hence it became necessary for either my companion or myself to drive while our Chinese hosts came on behind in another carriage. As it soon became apparent that unless I drove we should remain behind at Bukit Bruang, I was compelled reluctantly to take the ribbons, more especially as I found that our united weight amounted to close on 32 stone, to say nothing of the syce, who would be compelled to hang on behind somehow. The road did not belie our expectations, as it lies mostly through Tapioca estates, and cut up by constant bullock-cart traffic, with the end of charred trees projecting on one side, and living ones with enormous buttresses jutting out on the other, combined with stiff inclines and declines and sharp corners, so that it was out of the question altogether to think of looking at the vegetation as we passed.

Arrived at our destination, we found the machinery in splendid order, in three hours putting through 120 piculs (a picul is 133 lb.) of roots, one-fifth of which would be Tapioca eventually. On this estate about 20,000 acres are under cultivation. Reaching Bukit Bruang on the return journey safely, we changed vehicles, and arrived at Malacca at 8 p.m., visiting a very flourishing Nutmeg plantation belonging to Mr. Koh Hoon Boh on the way, and leaving our hospitable friends at their estates.

Arrived in Malacca, we found ourselves pretty well tired, but our labours were by no means yet at an end. My companion had declined several country invitations to dinner and a bed for each of us, as he had always been accustomed to put up at the house of a planting friend in Malacca, and depended on being able to do the same this time; consequently, on arriving at the entrance, we got our traps out and discharged the carriage. Judge of our surprise when, after sitting down a little while, we were told that Mr. — was

away at the plantation.

Calling a carriage, we started to find somewhere to put up at, as Malacca possesses no boarding-house or hotel, and as there is nothing to do in Malacca after 6 P.M. residents retire early, so on driving to one house after another we found them shut up for the night. Driving to the residences of some bachelor friends we were informed by the servants that "Master had gone for a walk, and the time of his return was uncertain." This caused us to look rather stupidly at each other, and after a drive all around the town I proposed that we should put up in the carriage for the night, my companion proposing that we should go back and take possession of the house of one of our absent friends. This we acted on, and suc-

ceeded admirably, being warmly welcomed by our host after the first surprise of finding "men in possession."

I have related this incident rather in detail as it will help to give some idea of the state of civilisation at which Malacca has arrived, and as a "word in season" to travellers who think of visiting Malacca to make sure of a bed before arranging to stay ashore a night there.

Next morning at 6 o'clock we were en route to another estate, belonging to Mr. Koh Hoon Boh, at Matchap, about 18 miles distant. The first ten miles is along the public road, along some parts of which in wet situations are large indigenous plantations of the Glam (Melaleuca leucodendron), the bark of which is used by Malays for caulking their boats. In all directions we saw the natives busy planting the Rice fields.

On leaving the public road, however, our troubles began; to drive over the road we did the day before was a delight compared with the one it now fell to our lot to drive over, and it was with no little satisfaction that I gave up the reins at Matchap to the syce, after his informing me when within 50 yards of the house that I had 2 miles more to drive. Here we found the primitive style at work. The roots are first half-peeled with knives, in which operation a large part of the root is cut off, then thrown into a tank of water when they are washed by the Chinese treading on them; thence they are lifted in baskets to the rasping machine, and worked by a traction engine, built in the brickwork, and is regulated by hand. The pulp falls from the rasper into baskets, which are carried about 20 yards, and the contents emptied on muslin covers of concave wickerwork baskets, above which a wooden water gutter is placed, the supply of water being regulated by plugs over the baskets. Here the Chinamen separate the starch by arranging a constant fall of water on the muslin, and keeping the mass well stirred with their hands until they think they have extracted all the starch, when they throw the refuse pulp away, and receive a fresh supply from the rasper, the water with which they wash the pulp serving to convey the starch to vats prepared for it. Of course the starch prepared in this manner requires more washing than that prepared by the machinery I have described, and I venture to think that consumers in England would preser Tapioca made by machinery, when it need never be handled, to that which is carried about so much amongst decaying vegetable matter and mud, as that hand-prepared usually is. Here the starch is baked by fire passing beneath a tile-covered flue on which it is placed. Pearl Tapioca is manufactured here as follows:—A cloth is attached like a hammock to the beams and kept open by cross sticks. A man at each end alternately jerks the cloth to and fro, the slightly warmed starch under this treatment soon forming small, completely spherical balls, which are afterwards baked on a tile-covered flue.

The number of coolies about here was surprising, and it is hardly necessary to say that only about 30 piculs of Tapioca is produced per diem; in fact, Mr. Koh Hoon Boh is so thoroughly convinced of the superiority of manufacture combined with economy of the preparation by machinery, after comparing the cost at his estate, which we visited the day before, with the cost of hand preparation, as at Matchap, that he ordered a machine to be erected at once.

After tiffin we returned to Malacca, where we were lodged and fed, in first-rate style, our host being Mr. Chea Hoon Bong, whose name is well known throughout the Straits (and beyond) as one of the most liberal-minded and hospitable Chinese gentleman in the colony. The next day we parted from our hospitable friends of Singapore per steamer Biliton, arriving on Sunday morning loaded with presents of fruit for ourselves and Singapore friends. Thus ended what is probably the last of my trips in the Malay peninsula, and certainly, thanks to my companion and our Chinese hosts, the most enjoyable one.

Can you or any of your readers give me any information as to the probable date of the introduction of Tapioca into the Straits, or by what nation it was first brought to the East? I have not Crauford's Descriptive Dictionary of the Indian Islands to refer to, but so far as I recollect he does not mention Manihot utilissima. Traveller.

Miller i Limaca 32 (1x6))
Phyllanthy Grisobahoum, Miller Wright Cala 582 4 1436 M. natares Guis non der Phyll. mirrandrug Mulle (Feadle Veneg Ph. primosus Poeph (ungel El. 590) The carnosuly miller With at sgo H. Minni gri 100. (135) M. Canhansis Wall. Mr. Poiretiann, milling Feat. Veny. 1198 M. Hirami var teneminelig terriphy Cale 1675-

0 1 2 3 4 5 6 7 8 9 10 cm copyright reserved



MISSOURI BOTANICAL GARDEN MISSOURI BOTANICAL GARDEN GEORGE ENGELMANN PAPERS

Marble Building Cor Fourth & Olive

0 1 2 3 4 5 6 7 8 9 10 cm copyright reserved

MISSOURI BOTANICAL GARDEN Eugherbin flegelliformis n. sp. annua glubernina destrutions destrutions destrutions of destrutions of destrutions of the files of folis liverities eteri soline et linearities paralles sections of the second of t marronulatis intigui, stipuli tringelai lameslatio into courtie, signi Strates, insolucionis volutariis pedirello six longion fuellis Este campo lalis Plobis Eningelentes glallas 2—4 pany fore convaves transia applialeter augustibes, Alifer brenten 6 fit; capsula subtaporen Frisula, sen- tos elsentes orhereis Engonis acuti: E. petaloides & flegille formi, Engl - Bold 1. 185. Eggjophylles Jefleyelejoni by 1 Owiss. Pupl De ODs. 11.2 p. 29. On the Plus Grande new Eller Might no 1826 Sandy plains of the Ten Jun A. or S.W Colons tigette with Epotatorder Eg. Mondege Alems 6-12 whole long leaves big ling /2-1 l. coide, booleen abt 3/ lie vide seeds of san length. The plat is winnitarto C pelaborder with with grown to gitten I, by the smaller javolur bean voy smill I delect nak I the more ween stang of the smill anther glads and by the smaller more argular no war pould growsh seeds, while those of the allies spening are hunger Thicker, with roll angles I of a monestich Colour; thrown enty or spect that the recept of the spirites and the discovery Att sub by Mr ambigue has and it formite I down satisfictory chamite, confirmed the suspice Congentations of the Micrifit Afferrees of both speries. The incorper, applying of the glas alone were not consil a sufficient character as many of their lumbers Sopietal and the off produce in the later are auture H. Similar appelops insteaments

0 1 2 3 4 5 6 7 8 9 10

cm copyright reserved GARDEN

to near its base, where, by salient angles meeting in the note center, the cavity is divised into 3 tubes, which lead to the avarian cells, somewhat obstructed, however, what the neck of the ovary by loose rellular tissue.

++ Titus lobis vij brivier vel acqualis Hill Sict. ed. 8, 1468; caulescen folis lanceslate - linearibus glauces centibus margine aculeis distantibus rectis parvis fustis dentato, spina terminalà valida terete saepe puto torta in marginem corneum decurrente basi ipsa soluin paulo exravata vi scapo elato foliareo-bracteato, panioulae ovalae cupsuligeme viviparaeque rames horizontalibres rumulosis fasciculos florum lexiores bracteis Triangularibus Brevibus stipatos gerentibus; ovario Berigomo paulo breviore, staminibus medie tubo infundibuli Jornie lobis paulo breviore vel supra medium insertés longe exsertis stylo demum aegus longis. _ Youveroya rigida, Haw. Syn. 74. Kunth Jen. 5.843. A. angustifolia Haw Saxif. 35; A. Ixtley, Karn ap. Salm, Host. Dyck, 304, Lacobi Ag. 95. Var. longifolia: folis mælto longioribus glauci, apulcato Dentatis, spina tormi nali non de cur Right Silling rente. Var? Sigalana: folis melte løgsørity viridioribus margine integris sen paucidentatis, sprina terminali non Lourrente, Agave Sipalana, serrine, vide infra, The original plant was acrording to Miller brought from Vera finy; my sperimens, were on which the above dignos is is based were collected in Juratan by D. Schott & Perrine 40, find I Schott 10 years ago studied Their interesting plant its different forms and economical rests

0 1 2 3 4 5 6 7 8 9 10

Copyright reserved

GARDEN

MISSOURI
BOTANICAL
GARDEN

E. poly carpa Schott, Arizon is new allomangianty [for shih I took it] it is S. Harlungii This, Harber 33 (E. Cheminger Aluka) C. Polyrage Bull! is = Parry den Diego = illevebroides Any Curromen Doiss is Wyll 1.854 Emy E poly rayer var ineffert Involver inter gle strigente.

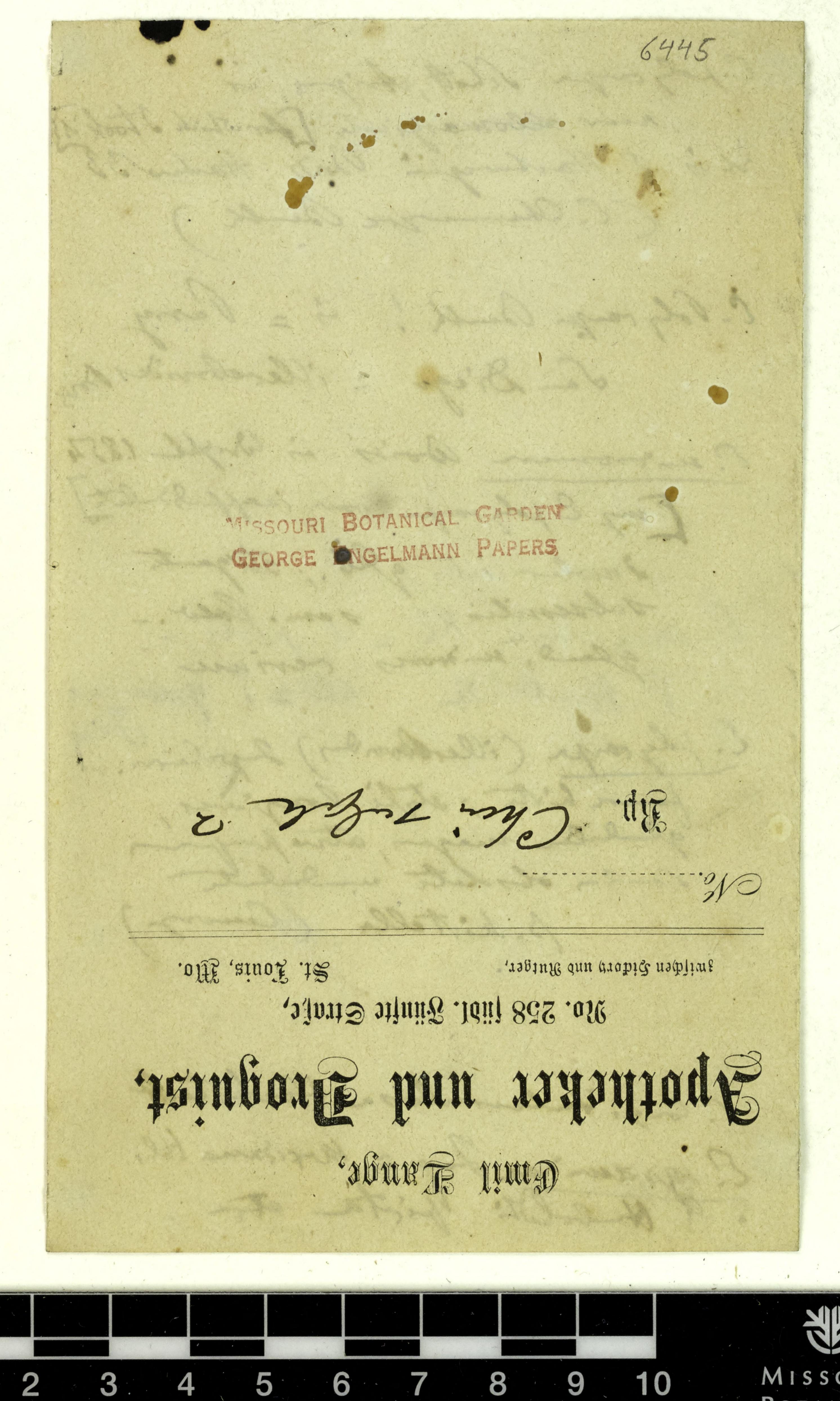
Subsessition Re same law.

gland in mores devine

Elfrade Ot all = Egranier E. plycape (illerboorder) Zybelenn. 7 fann hitt, styli longiner, gladen magan, attra propring soming obstate under the S. Listella (Comp) Congi telemosa Hochstart Egramme Leg : Muxisma Kl.

0 1 2 3 4 5 6 7 8 9 10 cm copyright reserved





copyright reserved

cm

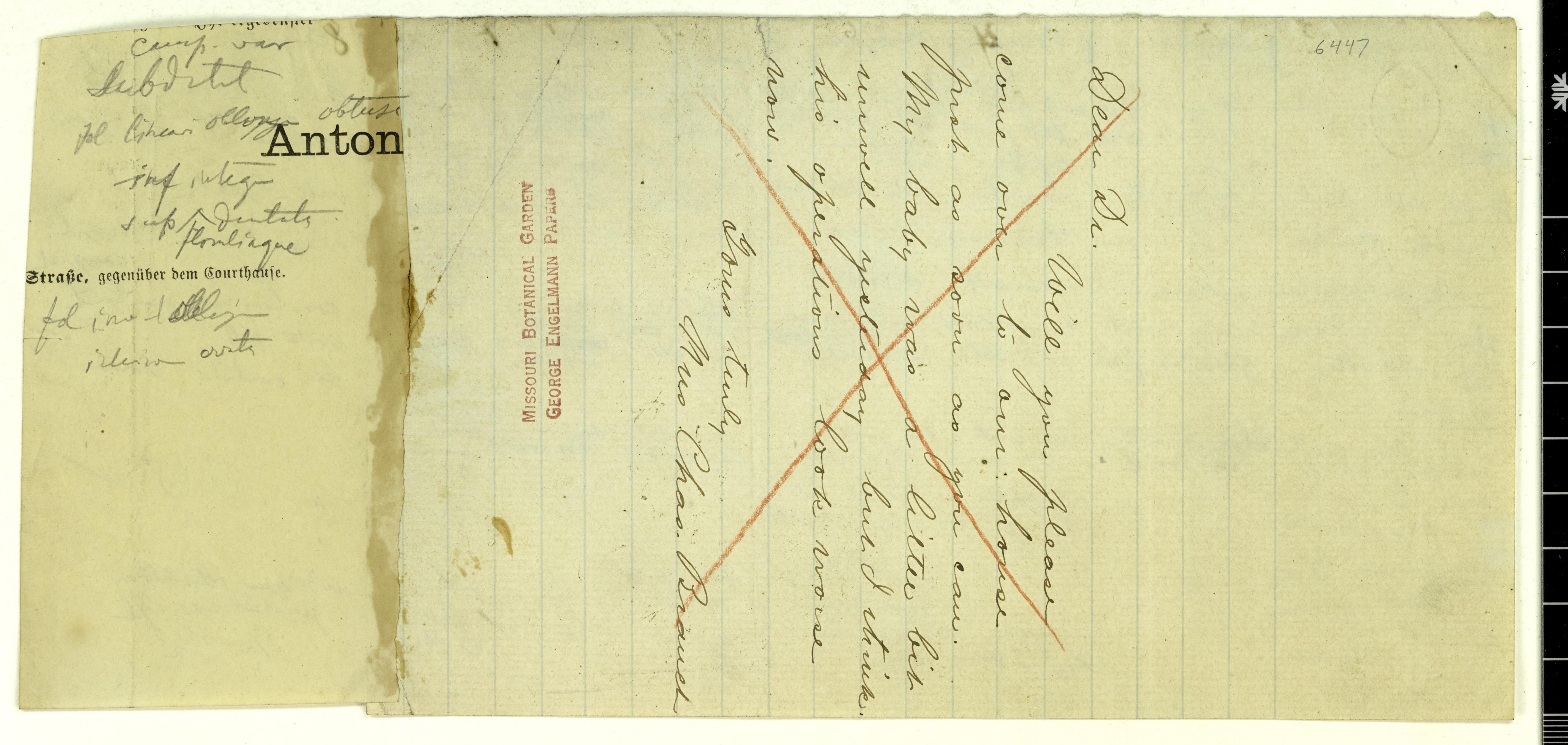
MISSOURI BOTANICAL GARDEN

Albricht Wim Roth Novre plantagum Speries punesation Judice on talif ex rollection & Denjami Hegnii Hallast 1821. Optavo 411 pag. Eugh. minghylle Ath = C. Hegniana
Sprye Eugh. mitrophylle Law. Ind. oriend. Whent from Cough. overthea Att. - Stand How. the other Sport Stand Stand Stand Att. Mande Monniel









Engl. Clip. - Driver of appending

46 Capitellate ly.

hyperfolia? 1. anisophyle 74 occlerts Sun graffely 83 selbonny, netta Toma In 39 mulanden Rom (95-touchyspenny) Tompare malanat 120 Kanton' Im) 141 Luggelle Falei ban A hay my 144 Detsiloba log. 195 mi sommen Dois, 146 polyrage Back (152 revolité En) Cors pand and 160 pelinlipen By 16, glystos Jemis (2) (165 Angrain (5) 23ggphle.V. (16h Ceanghylla Balla) (16h adempters Beth) - 5- Aleet o voiton 222 Kanti Cage 262 til rophylle Li II Exapped let 250 misen Bull. 265 - colomate By 266 en'autho Bud (268 minas Sell) 26 Tilky maley (395 lunide Cy). 4 Sparker \$33. Sithosperm Fx 19 (034 millionlis Eg) 10 Conhe 564 Ceptorem & S. manhata & (579 compestors Chanadoh!) (582 brukytern Eg) 022


0 1 2 3 4 5 6 7 8 9 10 cm copyright reserved

MISSOURI BOTANICAL GARDEN 586 montane English & MISSOURI MOTANICAL GARDEN GEORGE ENGELMANN PAPERS My Mal Much hit are a coe deut Mhis allowed al though 2 00 mat think it perious Ow how will to fund the bun - 1 4 m crain @ maine conside as Hough I would like to have you on on The 5/6 rained or whereales he finde which makes the Oprule Carne al Rough the Occupant was accompanied an a love none the The is but little dwellen which over hor while a, 4 MISSOURI

0 1 2 3 4 5 6 7 8 9 10 cm copyright reserved

MISSOURI BOTANICAL GARDEN

Folia.	Clurida Eng sessilia suberceta e basi angusta oblan ceolata acouta	Enlac. Eng E. peplophylla	perennes Flows E C. Palmeri Ry E.	odontadenia & brachyren	Intelinationally	2an. 1878 meiltomiles glebenimee C. campestry Schlochs	
							MISSOUR! BOTANICAL GARDEN
							8 9 10 ht reserved
							5 6 7 copyrig
							2 3 4



Botan Bemerk. No 18 Hønif m I Salike. the apply fof for it sig, " Stock refreger, grey, mit summonatur Bligilan, bliff affløredj. flag sold; deg soffelig, or Sestale, I delpfice Safor afalist inche aimen commontonte dibries, wif hun Kely. of finie 6) Shering with Och met en de didye 8 ovani ? valfall it des rus 3 Myli (32 - - - 6 - 5). frift ? 60. Mai - Mai - Thirt ofen Britans gidn Celastrinen gi gefor, rammet mit Evongenes i de blatte, in he stroffel bloth mefor mit Célastons. ein une 6 Genus Borga accommenda My ? Min Aflange Haint bound ship of geting 20 def l'incents fort i zill filft riberain. - foril, Di Doya aminute & Sief Co min May find Diville Through wil gay - The blattine 29 2: bally fact In ming from you of a boffing I Arcuminata, ale Borga follfin flor mass calgie 4 sepulo, stam. 2-3. _ flor fem: calgre 4 sque jugual. stigma capulat, Bassa monosperme. All motelf sufan Agnit 1835. Alor mase:

formentes
formentes
starn ni 8-12 monedelphis in ascillio briteonum oppositor, confersio internis sike brarteis - flor fem: ternis in axillis brarteonum, petrolatis, ralgre abortivo glassi. lis stipitatis (stanshib, abothiris) 3-4-6-8; ovanio ovato, bilorulari melli polyspermis, styla elongato set i junata rapitato. Leissi done Juni of 15-20 ff 3" Dit fand in Fort Gileson om Veorko for for for I The Full go if Donn ar un with it - yes. erun vamulis opines radi La MISSOURI

BOTANICAL GARDEN

English for folia from 16 blett f 11, 12 long of last of glant of returned in the standing of predument for lang all priol getalowdy of Suffer and grandy with Buil of Red dopple glott. Danne grun Strangford Signal BOTAN

GEORGE TO Sent more the known as large, blenden ny a cosplin - disperse to mys, being spender, stigned in the series of Eigherbie polygonishlia de Mied ling & glatt, blatte, Chravolloy, grall, and by the for figforing, solobling i muro, on fif, blefringe parise up a de file Insolitable go de fing (grand geleg) i John Lagriff the goods - Suthing: Type glatt, Janes grow fluing flowling groß In 6-7 Jefiel Din lang. Gybrell i 6 Dif di blatter di on de larjir une tout of Former 20 Di wift pelelonde song aux grynglunt. Long Island Rudling ? glatt blitt grant flip for the political Oblig guy di Dif gustiffeld opposit terte da 1 - C - 1 - Tel MISSOURI BOTANICAL GARDEN

Applie state institute institute of 1808 Junturaldrufum und sight for And gent organ Sugar organ. Northe glate 1423 Oan elys wift, wit gene from pains n- Ethyanifolia z- wet ffel med me when blifte I aming große. In I would glitten ilj 2: Taimen, you Sign Jymifel 25 & good und se aluja in Egskertin Sihotome ! Seremial CAN GARDEN C. Speramater T. Ece. IT, 657 wift for 2. Amal a. Seeds black, poulate E hyperirificia L Sulf fordersentend involuent glands petilon Shite suborbinlar, seed black forente. 6. Led reddrik grag L'hveelate or granuletes. E. varians E (frifa ma valeta grand) puberces or smooth, reed of grands grand grands grunn lated, E. manulate & (fif thy wifeling) hirs to, seed foreolates smooth, seed force the missing E. lateralis B. Deed smooth 1. gland not pelalond E. polygonifoli L' smooth, seed large 2. glads juta bil skrite E. retusa E smooth, seed n. DE sige, subterete, E. voirfoli. Ell smoth, sad smill avaite angled. MISSOURI BOTANICAL

copyright reserved

GARDEN

cm

Emphabia lateralis 13, august foli, more erest.
Ilaves namous with a rodrit tringe, the some towns the print; the tiples undri det subulite ænstet, slove same skepe et vige, but caprile and - seeds larger - and till St Pieme MISSOURI BOTANICAL copyright reserved cm

GARDEN

Ceanoth ovalis Canothus lanceslate n. sper fructivosa folis landelette trinervis nevis ocutis (bothends) glandeloso servatis, menis cum vamulis et peliolis subles puberentila, nevo mediano supra piloso; florume racemo composto subunbelleto. rapsulis aignis, eminibus panvis glavo-fusvis -Lidishitidis 1-2 pedalis sulese. In pinetis montosis saisosis regionis Chemitecon prope Fort Gibson, 10 Juni fruttbus matures weetiles Sort crites Maji cum Merini sucredes 3 I obbest sjulife in 4 blatt Eugherbia figh 14 561 1 obtavata: 1 gath ophora? 4 1 Dentata 4 1 d. vor lineanis 1 Evroipelin hermianiondes 4 1 thympolis maruleta 4 = 16 1 hypentijslis 4 2016 merchata human by 6 Enghorbia Ipacamenter & mind linge startly blin Muye glatt, offig, singeles, clithy gaz glat fof flighty fillgrin gag-te ple og donel, en de bogis strat spif, fing, for money hat, Think men. brinar. lærens, Bley- gestill, magel, predame not sin und for lang all petioli, gatolordiff Snifen ruge, ginnouse monginal: Sageth gall they knistanstig; Dann gov brown motflief (- sie augslaufun) brich 4 backing anjun inten auf zu carle de i concerne Then glall, min 3 in I failly Trying sons, free out of ruing In anner. Sollon sing Megen, in Manyton father, Contra Finge A Blatt: Beifer fort in Enphorbia Abyroci folia diviniale Si alsoffe of States find. Dif durinde fell find oben ligge affin wil affelter udge bleiter of lafor him gastiell sind. Tacean grain brain lif rofflig blad finagling,

0 1 2 3 4 5 6 7 8 9 10

Copyright reserved

GARDEN

MISSOURI
BOTANICAL
GARDEN

· 6451 4/264 Euphorbia mardatu. ?? Mude linge Augue afrig, mountly and your group is on blakfiel gitablished, with fast glatt, blitt gy ibyte, bingstill, obland, stirt integt feteronsat, fotoriel, gazannes, gazannes, stiple 2 ja ball mentation ditable landelis glad, in glads, -july certy siff of the state of bly for sign sind - grown blatting durind conglower fir. sig to while. grenewriff Driff mindig of. Kappel flag 3 handig, glabrionspula Pacción jufflif gura Tili and for the bouling will d'integrate parties granting I for I find the state of the s Ble Com Entert prostry. Aiton? 2: " Marin my min All alege gladfair. MISSOURI POTAMICAL GARDEN.

GEORGE ENGRE LAND GARDEN Exphorbie hyperisifolia format od of Dirguet, Com great gladt, eft det start gibet i algebrai. land, giflett. blitte oblog de oboyet stingt ting gotiel at the fift, at frang, I singer 5 An gland, gaforge gaza Di Gift, gyrita flif Ity colorlar und Miga vleid et en might in Sifthown Good offer Jon of the 5 De : forminal (y men, jutime & 3 mulplasser petiol getalais suf- sass sind, about I smit gorgen, dagte flat sport 3 bout; Some start of the some of the sound of the vide 2 page of Nº 18.

MISSOURI BOTANICAL copyright reserved GARDEN